# ICAO Long Term Traffic Forecast

## Methodology

# Background

This document describes the update of ICAO long-term air travel demand forecasting model to extend the historical estimation period from 1995 to 2015 and the forecast period from 2016 to 2045 respectively.[1] The model produces 30-year forecasts of travel demand for passenger and cargo markets that can be used for aviation policy and planning analyses. For the purposes of this work, passenger travel demand is modeled as Revenue Passenger Kilometers (RPKs) and divided across 50 ICAO specified route groups (covering both domestic and international travel), and cargo demand is in Freight Tonne Kilometers (RTKs) and divided across six global regions for total international and domestic cargo. These metrics are consistent with the previous forecasts that were generated using the 2012 as a baseline.

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[1] The previous forecast model had an estimation period of 1995 through 2012 and a forecast period of 2013 through 2042.

## Data and Methodology

### Data

Historical air traffic data are collected and harmonized from various sources including ICAO's statistics programme (Forms A, B, and C) and statistics published by national offices (US Department of Transportation, AVstats (UK CAA) etc.). The harmonized dataset covers over 90 percent of international air passenger traffic and 95 percent of freight traffic. Official Airline Guide (OAG) and Marketing Information Data Tapes (MIDT) are used to complement the data in regions with low reporting to arrive at a near 100 percent coverage. The final dataset includes historical data from 1995 through 2015 clustered at the route group and regional levels, respectively. Country specific economic and demographic data have been sourced from OECD- International Transport Forum (ITF). This includes real Gross Domestic Product in 2005 US$ and population. These data were aligned for each country/route group combination.

## Passenger Air Traffic Forecast Model Specification

A similar model specification (shown in equation1) as used in the previous long term forecast model, which was presented to ICAO assembly and CAEP, has been implemented on the updated traffic and economic data. Income band thresholds, which were based on the 2010 US$ in the previous model, have been converted to 2005 US$ using Bureau of Labor Statistics' Consumer Price Index (CPI) . This adjustment is necessary to correctly align the income thresholds with real GDP data obtained from OECD ITF that is in based on 2005 US$.

Equation1 :

$$\Delta nlo\widehat{gRPK}\_PC_{rt} = \sum_{i=1,j=1}^{6} \beta_i \left( T_j * \Delta nlogGDP\_PC_{rt} \right) + \beta_{Oil}\Delta nlog_{rt}Oil_{rt}Year\ Indicators$$

i : Tier Coefficient Index, j : Tier Index, t : Time, r=Route Group

## Freight Air Traffic Forecast Model Specification

For freight forecast six separate OLS equations were estimated. This was done to preserve the relatively large heterogeneity amongst the regions in terms of the relationship between RTKs and GDP. Updated historical traffic data from 1995 to 2015 were used to fit the model. Economic data for these models was also sourced from OECD ITF.

The cargo models were split into two groups based on total international RTKs and total domestic RTKs. All six regions were modeled for total international, while only four of the six regions were modeled for total domestic.[2] Similar variables were used in the cargo models as the passenger model; however, RTKs and GDP were not estimated in per capita terms.

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[2] Africa and Middle East were not modeled due to lack of variation and growth in the total domestic RTK market over the historical period. Forecasts for these two regions were pegged to their historical average.